



## Marshall, Boeing Ship First Station Element to Kennedy

The first major U.S.-manufactured International Space Station element, Node 1, was wrapped, packaged, and shipped to the Kennedy Space Center (KSC), Fla., last week.

The 18-foot-long by 14-foot-wide node will serve as a connecting element linking other major elements of the station together in orbit. Made of aluminum, the node has six hatches or doors which serve as docking ports for the other Space Station modules.

The shipping containers carrying Node 1 and its ground support equipment departed the Redstone Airfield Sunday night via two Air Force C-5 Galaxy aircraft.

While at KSC the node will complete its final outfitting and undergo a series of pre-launch tests. Node 1 is scheduled to be launched in July 1998 on the Space Shuttle. In orbit, it will join the Russian-built, U.S.-funded Functional Energy Block (FGB) module scheduled for launch on an unmanned Russian rocket in June of next year.

Once in orbit, the Shuttle will maneuver the node to dock with the FGB in the first Space Station assembly flight.

Meanwhile, work continues at Marshall as Boeing proceeds with outfitting the next major U.S. element to be launched -- the U.S. Laboratory.

The move was coordinated by the Marshall Space Station Development Office, particularly the Space Station Element Transportation System team headed by Jose Matienzo. The move team also included representatives from BAMSI, the Marshall Facilities Office, Security Office, and Safety and Mission Assurance Office, Boeing and McDonnell Douglas.



McDonnell Douglas workers drape Node 1, preparing it for final packaging in its flight shipping container. The Node was draped and moved from the manufacturing facility June 15. Photo by Emmett Given



The flight shipping container, carrying Node 1, is loaded into the back of a C5 Galaxy aircraft for shipment to Kennedy Space Center where it will undergo prelaunch tests. Photo by Emmett Given

## Marshall Spacelab Mission In Quest of Scientific Mysteries

by Bob Thompson

Searching to solve Earth-bound scientific mysteries in space, teams of researchers are set to pick up where they left off in April, with NASA's Microgravity Science Laboratory (MSL-1) returning to orbit aboard the Space Shuttle. Launch of Columbia is targeted for July 1.

This Shuttle launch is a re-flight of the Marshall-managed

MSL-1 mission dedicated to 33 experiments concentrated in the areas of protein crystals, combustion science and study of the properties of metals and alloys that are important to many industrial processes.

In April, the mission was cut short after four days because of problems with one of Columbia's fuel cells. The astronaut team

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# New Rocket Center Exhibit Highlights Marshall History

The role of Huntsville in the development of rockets and space exploration was highlighted Friday at the U.S. Space & Rocket Center when a 38,000 square foot exhibit designed to portray achievements of the Marshall Center and the U.S. Army Missile Command at Redstone was officially opened.

Alabama Governor Fob James, along with Marshall Center Director Dr. Wayne Littles; Major General James Link, commander of the U.S. Army Missile Command; Huntsville Mayor Loretta Spencer; and Madison County Commission Chairman Mike Gillespie opened "The Rocket City Legacy: Huntsville's Role in Space and Rocketry" exhibit.

Space Center visitors will notice renovations in the following areas:

- A three-dimensional, wall-mounted montage featuring the NASA enterprises and a Marshall Center full-screen video production highlighting Marshall employees. It includes directional signs for the museum and Spacedome Theater and is located adjacent to the current gift shop area.
- A new entryway ramp that leads up to the main museum from the front gift shop.
- An introductory area for the "A Time for Courage" theater and



Cutting the ribbon at the opening of the new Marshall exhibit at the Space and Rocket Center is from left, Gary Griffin, chairman of the Alabama Space Science Exhibition Commission; Major General James Link, commander of the U.S. Army Missile Command; Huntsville Mayor Loretta Spencer; Alabama Governor Fob James; Thad Mauldin, Space Center Executive Director; Marshall Center Director Dr. Wayne Littles; and Chairman of the Madison County Commission Mike Gillespie. Photo by Dennis Keim

the theater area which includes bench-style seating and features a new music video covering the history of Huntsville's contributions to the space program. The music is performed by Marshall's Tina Swindell and produced and edited by Debbie Solomon and Sarah Milligan of Marshall Television.

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## Marshall Research Sheds New Light on Spinning Black Holes

by Kelly McFalls

A NASA scientist has made the first ever observation of spinning black holes — confirming Einstein's theory that black holes do spin. The new observations from several orbiting spacecraft shed light on how these mysterious objects are formed and behave.

Black holes — predicted by Einstein's General Theory of Relativity — are believed to result from the collapse of a star or a group of stars.

A black hole is an extremely compact and massive object with such a powerful gravitational field that nothing — not even light — can escape.

In a paper published June 20 by The Astrophysical Journal, Letters, Dr. Shuang Nan Zhang of the Universities Space

Research Association at Marshall's Space Sciences Laboratory and his research associates report that two of the black holes they've studied are rapidly spinning — rotating 100,000 times per second — while others are spinning very slowly or not at all.

By comparison, before this discovery, the Crab Pulsar was considered to be among the most rapidly spinning objects in the universe — rotating 33 times per second.

"Black holes have always been difficult objects to define. We can only characterize them with three properties — mass, charge and spin," said Zhang.

"In the past, we've only been able to measure a black hole's mass. But now that we've learned how to measure a second property — spin rate — one might

say that we are two-thirds of the way to understanding black holes. This is a major leap in unraveling the black hole mystery," said Zhang.

"The two rapidly spinning black holes (named GRO J1655-40 and GRS-1915+105-) also occasionally eject streams of high-speed material called relativistic jets from the black hole region — at roughly the same speed at which the hole is spinning," said Zhang.

Since a black hole emits no light, the best way to observe it and learn about its properties is to study its interaction with the environment around it.

"The Theory of Relativity explains that there should be a last stable orbit around the black hole," said Zhang. "Material inside this orbit cannot survive and is consumed by the black hole."

## Smelser to Lead Flyback Study

Jerry Smelser, deputy manager for the External Projects Office, has been detailed to the Marshall Center's new Space Transportation Programs Office to lead the Liquid Flyback Booster definition study, pending formal approval by NASA Headquarters.

Smelser has been responsible for managing development activities for the new Super Lightweight Tank.

In announcing the assignment, Center Director Wayne Littles said that Smelser "has extensive and specialized experience in space transportation systems development and project management. His expertise in program and project level planning will be invaluable during the implementation activities associated with the new organization."

## New Exhibit Features Marshall

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- "The Rocket City Legacy: Huntsville's Role in Space and Rocketry" area which includes artifacts, exhibits, videos and photographs of the city's space legacy.

The Marshall portion of the exhibit includes copy, artifacts and photographs that span from the day President Eisenhower came to Huntsville to dedicate the Marshall Center on Sept. 8, 1960 to the recent calibration of the mirrors for the Advanced X-Ray Astrophysics Facility, according to Mike Wright, Marshall Center Historian, who along with Ed Medal of the Public Affairs Office, led the Center's overall effort on the exhibit.

"We tried to find everything we could that illustrated Huntsville's role in the space program, then lay it out on the table and decide whether it might be a candidate for the exhibit," said Wright. "Of course, this was a labor intensive effort since many of the photographs were made years ago."

Getting things ready for the exhibit meant plowing through published sources or working with veteran employees to verify the text of photo captions, Wright said.

"We wanted visuals and copy for the exhibit to show both the technical and the human side of Marshall — the contributions that thousands of Marshall people in Huntsville and elsewhere have made to the space program since the Center was created in 1960," added Wright.

The area is the first phase of an overall museum renovation plan which stretches through the year 2000.

### Obituaries

**Judy Burgess, 59**, Huntsville, died June 19. At the time of her death she worked in GP40 as a procurement clerk, having served 37 years at Marshall. She is survived by her daughter Pam Brown.

**Frederick Nicholson, 75**, Huntsville, died May 26. He retired from Marshall in 1979 where he worked as an aerospace engineer. He is survived by his wife Lottie Thornton.

**James Williamson, 75**, Huntsville, died June 6. He retired from Marshall in 1978 where he worked in aerospace materials.

**Erich Ziesmer, 84**, Huntsville, died June 6. He retired from Marshall in 1974 where he worked in the Astrionics Laboratory. He is survived by his wife Sigrid Ziesmer.



Judy Burgess



Gloria Hullett-Smith, chief of the Systems Branch in the Mission Operations Laboratory, shows her daughter Amberley Smith how the Payload Crew Training Complex communicates with and flows data to the Payload Operations Control Center during Marshall's annual "Take Our Children to Work Day" activities last week. Also observing is Amberley's friend Daveda Chatman.

Photo by Terry Leibold

## Microgravity Science Reflight

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and investigators at the Marshall Center were only able to begin their schedule of experiments which had been planned for 16 days.

"Those four days allowed our first Microgravity Science Laboratory team to barely open the door to tantalizing scientific research," said Joel Kearns, manager of NASA's Microgravity Research Program Office at the Marshall Center. "We were able to verify that we are headed in the right direction. But we were not able to reach our destination because of the shortened mission."

"The success we've glimpsed from the shortened Shuttle mission in April makes it clear that we're heading in the right direction," said Kearns. "All activated research apparatus functioned in an outstanding manner. This upcoming mission has the potential to add considerably to our basic scientific knowledge and our quality of life here on Earth," Kearns pointed out.

"The main focus of reflight preparation was replenishment of science experiment samples and replacement of expendables required to run the experiments, such as filters, batteries and fuel sources, explained MSL Mission Manager Teresa Vanhooser of Marshall Flight Projects Office. "All the science experiment teams are excited to have the opportunity to re-fly this important mission. We're looking forward to launch and a great science mission."

The Microgravity Research Program sponsors the Spacelab microgravity science research flights.

## Employee Ads

### Miscellaneous

- ★ Browning BDM double-action 9mm high capacity \$500. 882-0271
- ★ Murray lawn mower 16HP, 46 in. cut, used 3 seasons \$650. 881-8149
- ★ Wilson X-31 plus golf clubs 3 thru PW \$75. 883-1025
- ★ Canon Photura camera. All manuals and original box \$95. 464-9352
- ★ RCA 35" TV cabinet \$75. 882-1341
- ★ Snapper rear engine 12.5 HP, mulcher blade, bought Nov. 93, 33" cut. \$1000 o.b.o 883-9020
- ★ Two used 31 x 10.5, R15 LT General Grappler tires \$15 each. Call after 5 p.m. 881-0656
- ★ Wedding dress detachable train, size 12, champagne beaded lacework on top sleeves and train \$350. 205-498-5520
- ★ Crib \$130; car seat \$30; high chair \$30; Gerry back pack \$35. 464-9408
- ★ Antique player piano with over 100 music rolls \$550. 883-2919
- ★ Men's Sears 10-speed bicycle \$35. 355-6525
- ★ Refrigerator, 20.7 cuft, Kenmore, almond, 7 years old, upright model \$325. 895-0160
- ★ Brown metal desk \$50. 852-2346
- ★ Soloflex with butterfly and leg attachments \$495.
- ★ VITO alto saxophone best offer over \$200. 895-9348
- ★ Draw tight trailer hitch, fits 85-92 Buick Park Avenue and 86-91 Buick LeSabre \$40. 881-0656
- ★ One girls and 3 boys bicycles. 461-7962
- ★ Toro commerical quality mower, rear bagger, self propelled \$100. 837-0085
- ★ Queen size mattress and box spring set, Sealy Posturepedic \$250 o.b.o. 880-9025
- ★ Lapidary (rock cutting and polishing) equipment. 881-1718

### Vehicles

- ★ 1989 Olds Cutlass Cierra, 114K miles \$3,800; 1995 Toyota Tacoma, 15K, \$11,800. 722-0262
- ★ 1978 Honda Gold Wing \$1,500; 1977 Wellcraft boat, 18 ft. inboard/outboard \$2,750. 232-4610
- ★ 1983 Chevy Blazer 4x4. New engine and transmission \$3,000 or best offer. 539-6106
- ★ 1991 Mazda RX-7 Coupe, 5-speed, adult owned, 57K miles \$9,000. 881-0645
- ★ 1988 Sentra, 2-door, 4-speed, a/c, new tires, 92K miles \$2,650. 533-3087
- ★ 1978 Ford utility van 75K miles, new motor, ladder rack, new paint \$2,200. 837-0085

### Wanted

- ★ 10 or 12 ft. flat bottom boat. No trailer or motor needed. 776-5031
- ★ Old wrist or pocket watches, running or not. 883-6969
- ★ Will trade Ty Lucky the ladybug for Nuts the squirrel. Leave message. 828-4502

### Free

- ★ Three 6 week old kittens. Indoor pets; one female Calico type, two male (one orange & one black) 536-7541

## Center Announcements

- ☛ **MOO**— The Management Operations Office retirees will meet for breakfast/lunch on June 26 (4th Thursday each month) at the Cracker Barrel in Madison at 10 a.m. In addition to retirees, all present or former MOO employees are welcome. Call 539-0042 if you have any questions.
- ☛ **Toastmasters**— Redstone Toastmasters International will meet

every Tuesday at 6 p.m. in the Morrison's Cafeteria in Madison Square Mall. For more information call 461-0476.

- ☛ **Procurement Seminar**— The seminar "Socio-Economic Procurement as a Business Imperative" will be held June 26, 8:30 a.m. to 4 p.m., in Bldg. 4200, Room P110. The presenter will be Reginald Williams from Procurement Resources, Inc., Atlanta, GA. The seminar will focus on the benefits and value of Supplier Diversity. The learning process will be focused on NASA systems and procedures. Please call Stanley McCall (4-0254) for registration.
- ☛ **STOPABUSE**: — Aware of waste, fraud or abuse? Telephonically contact the MSFC Office of Inspector General at 4-9188 or send complaints to mail stop M-DI. Confidentiality will be maintained.
- ☛ **Huntsville L5 Society** — Hosting a presentation June 25, from 7 to 8:30 p.m. Topic is "Solar Thermal Propulsion Utilizing Polyimid Fresnel Lenses," by Rodney Bradford, president of United Applied Technologies, in the Huntsville-Madison County Public Library auditorium, 915 Monroe Ave., free, public welcomed, 461-3064 or 721-1083.
- ☛ **Toastmasters International** — Toastmasters International will have a lunch meeting each Tuesday from 11:30 a.m. to 12:30 p.m. in Bldg. 4610, cafeteria conference room.

## Job Opportunities

**CPP 97-36-CV, AST, Mission Operations Integration, GS-801-14,** Flight Projects Office, Space Station Utilization Ofc, EXPRESS Rack Ofc. Closes June 23.

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